

Some remarks on solar eclipses

"Measuring" excitement at totality on August 21, 2017

[Robert Nufer](#)

6. September 2017

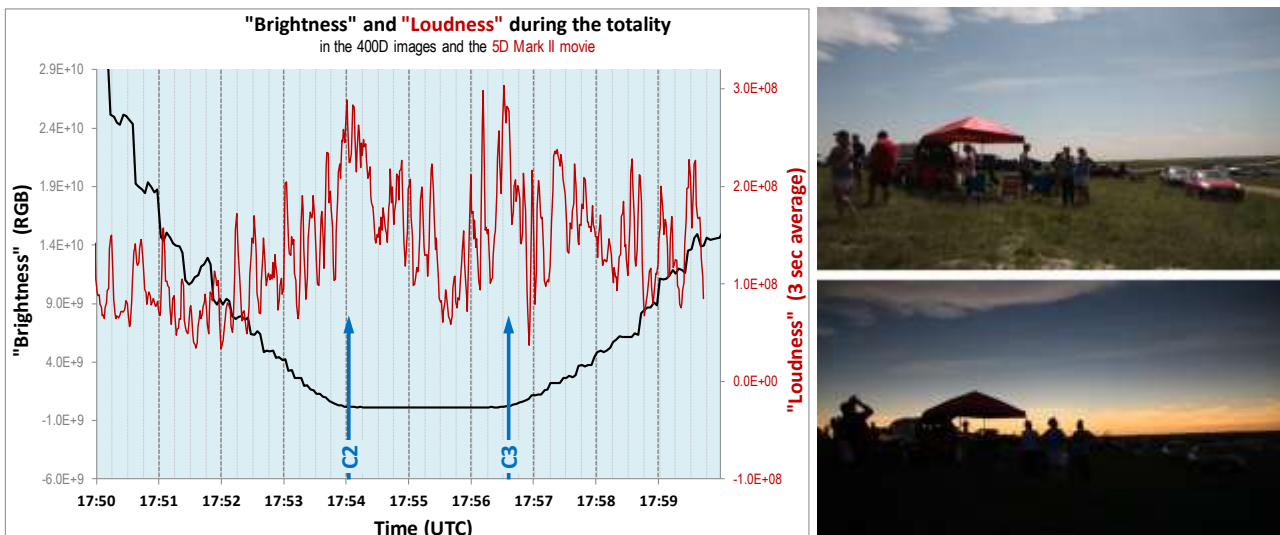
Witnessing a total solar eclipse (TSE) is an overwhelming and exciting experience. There is a (Scottish) proverb "When the heart is full the tongue will speak". Experienced eclipse observers will already have noted this phenomenon. For my twelfth TSE, I decided to "measure" and to document the effect on August 21, 2017. Our observation site was near Stapleton, NE, where totality lasted for 2:33 minutes.

A few minutes before totality, I put a tripod mounted camera pointing to a group of about ten people of eclipse observers and recorded a MOV file. From this file, the sound data were extracted and summed for every second (Sum of the absolute 16-bit amplitude values). This is the red curve labelled "Loudness" in the chart below.

With another tripod mounted camera (pointing to a nearby meadow) pictures were taken using an intervalometer (3 seconds intervals). The image "brightness" was computed from the RGB values of the pixels in each file. This is the black curve labelled "Brightness" in the chart below.

As perfect time synchronization between cameras is not possible, there was a small misalignment of about 15 seconds between the curves, which was manually adjusted.

Indeed, near the begin of the totality (second contact "C2"), as well as near the end of totality (third contact "C3"), two "excitement" peaks are clearly recognized. The "loudness" peak only one minute after C3 stems from a Quad Bike driver selling refreshments and snacks on the viewing area. This was also the moment, when the first cars left the viewing area!



Left:

The brightness (black curve) was measured by summation of the RGB values in a series of images showing the nearby meadow. (Camera: Canon 400D, 28 mm, F/4, ISO 200; AV mode) The loudness (red curve) was measured from the audio trace of a movie (Camera: Canon 5D Mark II).

Right:

The group of eclipse observers on the "Kramer Viewing Site" near Stapleton, NE shortly before (top) and during (bottom) totality. The loudness was computed by summing the absolute values of the audio trace.